

CLAIMS:

1. A mobile telephone apparatus operable in a CDMA (code division multiple access) communications system,

comprising:

5 a despreding circuit for despreding received spectrum-spread data of a plurality of branches to produce despread data each corresponding a plurality of fingers;

a frequency offset detector for detecting a frequency offset for each of the fingers from the despread data;

10 a movement determiner for determining whether the mobile telephone is moving at speeds higher than a predetermined speed, based on frequency offsets received from the frequency offset detector; and

15 a mode controller for switching an operation mode between a drive mode and a normal mode depending on whether the mobile telephone apparatus is moving at speeds higher than the predetermined speed.

2. The mobile telephone apparatus according to claim 1, wherein the movement determiner comprises:

20 a Doppler frequency calculator for calculating Doppler frequencies for respective ones of the branches by combining the frequency offsets for respective ones of the fingers;

a first determiner for determining whether there is a pair of Doppler frequencies satisfying a first condition such that the Doppler frequencies are of opposite sign;

a second determiner for determining whether the
5 Doppler frequencies satisfy a second condition such that an absolute value of each of the Doppler frequencies is not smaller than a first reference value; and

a determination controller for determining that
10 the mobile telephone apparatus is moving at speeds higher than the predetermined speed when a pair of Doppler frequencies satisfying the first and second conditions exists.

3. The mobile telephone apparatus according to claim
2, wherein the determination controller outputs a first
15 interrupt signal to the mode controller when the pair of Doppler frequencies satisfying the first and second conditions exist and outputs a second interrupt signal to the mode controller when a pair of Doppler frequencies satisfying the first and second conditions does not exist,

wherein the mode controller sets the mobile
20 telephone apparatus to the drive mode when receiving the first interrupt signal and sets the mobile telephone apparatus to the normal mode when receiving the second interrupt signal.

4. The mobile telephone apparatus according to claim
1, wherein the movement determiner comprises:

a branch frequency offset calculator for calculating branch frequency offsets for respective ones of the branches by combining the frequency offsets for respective ones of the fingers;

5 a first determiner for determining whether there is a branch frequency offset satisfying a first condition such that an absolute value of the branch frequency offset is greater than a second reference value;

10 a second determiner for determining whether there is at least one branch frequency offset satisfying a second condition such that an absolute value of the branch frequency offset is not greater than a maximum correction threshold of AFC (automatic frequency control) operation performed in the mobile telephone apparatus; and

15 a determination controller for determining that the mobile telephone apparatus is moving at speeds higher than the predetermined speed when there are both the branch frequency offset satisfying the first condition and the at least one branch frequency offset satisfying the second condition.

20 5. The mobile telephone apparatus according to claim 4, wherein the determination controller outputs a first interrupt signal to the mode controller when there are both the branch frequency offset satisfying the first condition and the at least one branch frequency offset satisfying the second
25 condition, and outputs a second interrupt signal to the mode

controller when there is neither the branch frequency offset satisfying the first condition nor the at least one branch frequency offset satisfying the second condition,

wherein the mode controller sets the mobile
5 telephone apparatus to the drive mode when receiving the first interrupt signal and sets the mobile telephone apparatus to the normal mode when receiving the second interrupt signal.

6. The mobile telephone apparatus according to claim 1, further comprising:

10 a display controller for controlling a display device when the mobile telephone apparatus is moving at speeds higher than the predetermined speed such that a message indicating that the mobile telephone apparatus is moving at speeds higher than the predetermined speed is displayed on the
15 display device.

7. The mobile telephone apparatus according to claim 1, further comprising:

a voice message generator for generating a predetermined voice message when an incoming call occurs during
20 the drive mode; and

a communication controller for transmitting the predetermined voice message to a caller.

8. The mobile telephone apparatus according to claim

6, further comprising:

a voice message generator for generating a predetermined voice message when an incoming call occurs during the drive mode; and

5 a communication controller for transmitting the predetermined voice message to a caller.

9. The mobile telephone apparatus according to claim 1, further comprising:

10 a communication controller for transmitting a network system a drive-mode message indicating that the mobile telephone apparatus is moving at speeds higher than the predetermined speed, when the operation mode has been changed to the drive mode,

15 wherein the network system has a voice message system in which, when an incoming call occurs after having received the drive-mode message from the mobile telephone apparatus, the voice message system transmits a predetermined voice message to a caller.

20 10. The mobile telephone apparatus according to claim 6, further comprising:

a communication controller for transmitting a network system a drive-mode message indicating that the mobile telephone apparatus is moving at speeds higher than the predetermined speed, when the operation mode has been changed

to the drive mode,

wherein the network system has a voice message system in which, when an incoming call occurs after having received the drive-mode message from the mobile telephone apparatus, the voice message system transmits a predetermined voice message to a caller.

11. A method for detecting movement of a mobile telephone which is operable in a CDMA (code division multiple access) communications system, comprising the steps of:

a) detecting a frequency offset for each of N fingers from despread data which are obtained by despreading received spectrum-spread data of M branches, wherein N and M are integers greater than 1; and

b) determining whether the mobile telephone is moving at speeds higher than a predetermined speed, based on N frequency offsets detected by the step (a).

12. The method according to claim 11, wherein the step (b) comprises the steps of:

calculating M Doppler frequencies for respective ones of the M branches by combining the N frequency offsets for respective ones of the N fingers;

determining whether there is a pair of M Doppler frequencies, Df_i and Df_j , satisfying $Df_i \times Df_j < 0$, wherein i and j are an integer greater than 0;

determining whether the Doppler frequencies Df_1 and Df_2 satisfy a second condition such that an absolute value of each of the Doppler frequencies Df_1 and Df_2 is not smaller than a first reference value; and

5 determining that the mobile telephone is moving at speeds higher than the predetermined speed when a pair of Doppler frequencies satisfying the first and second conditions exists.

13. The method according to claim 11, wherein the step
10 (b) comprises the steps of:

calculating M branch frequency offsets for respective ones of the M branches by combining the N frequency offsets for respective ones of the N fingers;

15 determining whether there is a branch frequency offset satisfying a first condition such that an absolute value of the branch frequency offset is greater than a second reference value;

determining whether there is at least one branch frequency offset satisfying a second condition such that an
20 absolute value of the branch frequency offset is not greater than a maximum correction threshold of AFC (automatic frequency control) operation performed in the mobile telephone apparatus; and

determining that the mobile telephone apparatus
25 is moving at speeds higher than the predetermined speed when

there are both the branch frequency offset satisfying the first condition and the at least one branch frequency offset satisfying the second condition.